

## Study Guide

3.1 Blue Book

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**Parallel Lines and Planes**

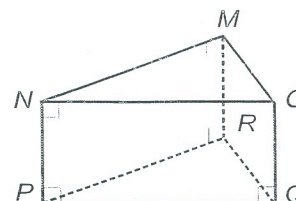
When planes do not intersect, they are said to be **parallel**. Also, when lines in the same plane do not intersect, they are **parallel**. But when lines are not in the same plane and do not intersect, they are **skew**.

**Example:** Name the parts of the triangular prism shown at the right. Sample answers are given.

parallel planes: planes  $PQR$  and  $NOM$

parallel segments:  $\overline{MO}$  and  $\overline{RQ}$

skew segments:  $\overline{MN}$  and  $\overline{RQ}$

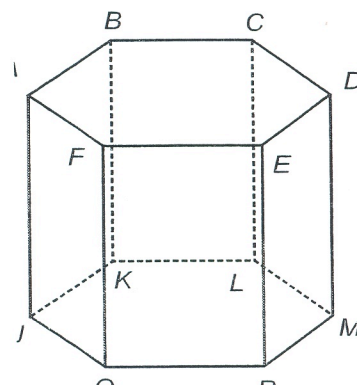


**Refer to the figure in the example.**

1. Name two more pairs of parallel segments.
2. Name two more segments skew to  $\overline{NM}$ .
3. Name a segment that is parallel to plane  $MRQ$ .

**Name the parts of the hexagonal prism shown at the right.**

4. three segments that are parallel to  $\overline{BC}$
5. three segments that are parallel to  $\overline{JK}$
6. a segment that is skew to  $\overline{QP}$
7. the plane that is parallel to plane  $AJQ$



**Skills Practice**

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**Parallel Lines and Planes***Describe each pair of segments in the prism as parallel, skew, or intersecting.*

1.  $\overline{EG}, \overline{ML}$

2.  $\overline{LK}, \overline{EG}$

3.  $\overline{LK}, \overline{GH}$

4.  $\overline{EG}, \overline{GH}$

5.  $\overline{JN}, \overline{ML}$

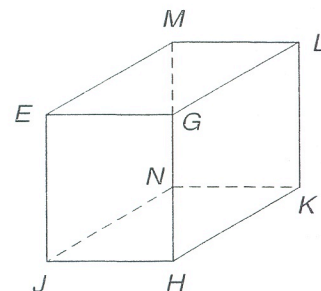
6.  $\overline{LK}, \overline{NK}$

7.  $\overline{NK}, \overline{JH}$

8.  $\overline{EG}, \overline{HK}$

9.  $\overline{MN}, \overline{LK}$

10.  $\overline{MN}, \overline{GL}$

*Use the figure for Exercises 1–10. Name the parts of the rectangular prism.*

11. six planes

12. all pairs of parallel planes

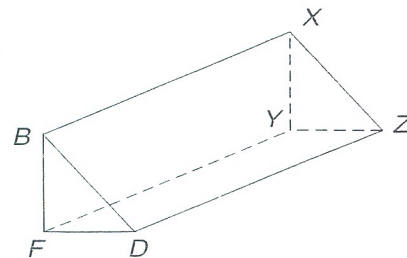
13. all segments skew to  $\overline{JH}$ 14. all segments parallel to  $\overline{EG}$ 15. all segments intersecting  $\overline{ML}$ 16. all segments parallel to  $\overline{JN}$ *Name the parts of the triangular prism.*

17. all pairs of intersecting planes

18. all pairs of parallel segments

19. all pairs of skew segments

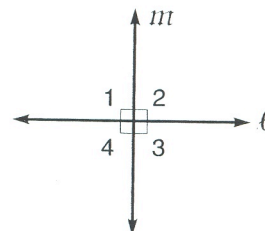
20. all points at which three segments intersect



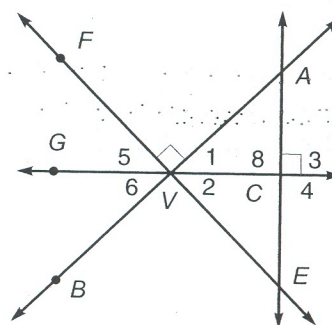
## Study Guide *3.1 Blue*

### Perpendicular Lines

**Perpendicular lines** are lines that intersect to form four right angles.



$\overline{AB} \perp \overline{FE}$ ,  $\overline{AE} \perp \overline{GC}$  and  $C$  is the midpoint of  $\overline{AE}$ . Determine whether each of the following is true or false.



1.  $\overline{GV} \perp \overline{AE}$
2.  $\overline{AE} \perp \overline{FV}$
3.  $\angle 4 \cong \angle 1$
4.  $\angle 3 \cong \angle 4$
5.  $m\angle 1 + m\angle 2 = 90$
6.  $m\angle 3 + m\angle 4 = 180$
7.  $m\angle 1 + m\angle 5 = 90$
8.  $m\angle 4 = m\angle 1 + m\angle 2$
9.  $m\angle AVF = 90$
10.  $m\angle BVE = 90$
11.  $\angle GVA$  is a right angle.
12.  $\angle 3$ ,  $\angle 4$ , and  $\angle 8$  are right angles.
13.  $\angle 6$  and  $\angle 3$  are supplementary.
14.  $\angle 2$  and  $\angle 6$  are complementary.
15.  $\angle FVB$  and  $\angle 4$  are complementary.
16.  $\angle AVE$  and  $\angle BVF$  are supplementary.
17.  $\overline{AE}$  is the only line perpendicular to  $\overline{GC}$  at  $C$ .

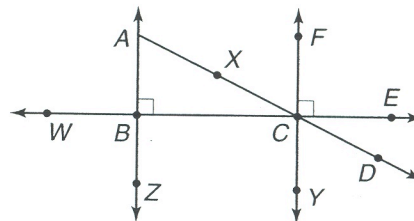


## Skills Practice

*Blue*

### Perpendicular Lines

$\overline{AB} \perp \overline{BE}$ ,  $\overline{FC} \perp \overline{BE}$ , and point  $X$  is the midpoint of  $\overline{AC}$ . Determine whether each of the following is true or false.



- $\angle XCB \cong \angle DCE$
- $\angle BCY$  is a right angle.
- $\angle FCE$  and  $\angle FCX$  are supplementary.
- $\overline{AB} \perp \overline{BC}$
- $\angle FCD$  is a right angle.
- $\angle FCX$  and  $\angle XCB$  are complementary.
- $m\angle WBZ > m\angle WBA$
- $\overline{FC}$  is the only line  $\perp$  to  $\overline{WE}$  at  $C$
- $\angle FCE$  and  $\angle YCE$  are supplementary.
- $\overline{AX} \cong \overline{XC}$
- $\angle FCD \cong \angle WBA$
- $\overline{AX} \cong \overline{FC}$
- $\overline{AB} \perp \overline{AC}$
- $\angle XCF \cong \angle DCY$

$\overline{BM} \perp \overline{MC}$ ,  $\overline{MA}$  and  $\overline{MD}$  are opposite rays.

- If  $m\angle DMC = 25$ , find  $m\angle AMB$ .
- If  $m\angle AMB = 72$ , find  $m\angle DMC$ .
- If  $m\angle DMC = 2x + 2$  and  $m\angle AMB = 8x - 2$ , find  $m\angle DMC$  and  $m\angle AMB$ .

